

WHAT IS CLAIMED IS

1. A method for selecting for robustness among two or more animals, the method comprising the steps of:
5 providing two or more animals of the same species;
 determining in each animal the quantity of CD16 antigen-expressing cells; and
 selecting the animal with the lowest quantity of CD16 antigen-expressing cells,
10 thereby selecting for robustness among two or more animals.
2. A method for selecting for robustness among two or more animals, the method comprising the steps of:
15 providing two or more animals of the same species;
 determining in each animal the quantity of CD16 and CD2 double-positive antigen-expressing cells; and
 selecting the animal with the lowest quantity of CD16 and CD2 double-positive antigen-expressing cells,
20 thereby selecting for robustness among two or more animals.
3. A method for selecting for robustness among two or more animals, the method comprising the steps of:
25 providing two or more animals of the same species;
 determining in each animal the quantity of CD8 antigen-expressing cells; and
 selecting the animal with the lowest quantity of CD8 antigen-expressing cells,
30 thereby selecting for robustness among two or more animals.
4. A method for selecting for robustness among two or more animals, the method comprising the steps of:
35 providing two or more animals of the same species;
 determining in each animal the quantity of MHC-DQ antigen-expressing cells; and

selecting the animal with the highest quantity of
MHC-DQ antigen-expressing cells,
thereby selecting for robustness among two or more
animals.

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5. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

providing two or more animals of the same species;

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determining in each animal the quantity of cells
expressing an antigen that is targeted by MHC-DQ
antibodies as MHC-DQB; and

selecting the animal with the highest quantity of
cells expressing an antigen that is targeted by MHC-DQ
antibodies as MHC-DQB,

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thereby selecting for robustness among two or more
animals.

6. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

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providing two or more animals of the same species;

determining in each animal the quantity of cells
expressing an antigen that is targeted by MHC-DQ
antibodies as MHC-DQD; and

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selecting the animal with the highest quantity of
cells expressing an antigen that is targeted by MHC-DQ
antibodies as MHC-DQD,

thereby selecting for robustness among two or more
animals.

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7. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

providing two or more animals of the same species;

determining in each animal the proliferation
frequency of CD4 antigen-expressing cells; and

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selecting the animal with the lowest proliferation
frequency of CD4 antigen-expressing cells,

thereby selecting for robustness among two or more animals.

8. The method of claim 1, wherein the species is
5 selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

9. The method of claim 2, wherein the species is
10 selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

10. The method of claim 3, wherein the species is
15 selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
20 *Branta canadensis*.

11. The method of claim 4, wherein the species is
selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
25 *Branta canadensis*.

12. The method of claim 5, wherein the species is
selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
30 *Branta canadensis*.

13. The method of claim 6, wherein the species is
35 selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus*

domesticus, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

14. The method of claim 7, wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

15. A method for selecting for robustness among two or more animals, the method comprising the steps of:
providing two or more animals of the same species;
determining in each animal the quantities of CD16 antigen-expressing cells, CD16 and CD2 double-positive antigen-expressing cells, CD8 antigen-expressing cells, MHC-DQ antigen-expressing cells, cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQB, and cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD;
determining in each animal the proliferation frequency of CD4 antigen-expressing cells; and
selecting the animal with the lowest quantity of CD16 antigen-expressing cells, the lowest quantity of CD16 and CD2 double-positive antigen-expressing cells, the lowest quantity of CD8 antigen-expressing cells, the highest quantity of MHC-DQ antigen-expressing cells, the highest quantity of cells expressing an antigen targeted by MHC-DQ antibodies as MHC-DQB, the highest quantity of cells expressing an antigen targeted by MHC-DQ antibodies as MHC-DQD, and the lowest proliferation frequency of CD4 antigen-expressing cells,
thereby selecting for robustness among two or more animals.

16. The method of claim 15, wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus*

domesticus, *Meleagrus gallopavo*, *Anas rubripes*, and
Branta canadensis.

17. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

providing two or more animals of the same species;
determining in each animal the quantity of CD16

antigen-expressing cells;

determining a statistically significant association
between an animal's quantity of CD16 antigen-expressing
cells and robustness; and

selecting for the animal in order to improve
robustness based on the association.

18. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

providing two or more animals of the same species;

determining in each animal the quantity of CD16 and
CD2 double-positive antigen-expressing cells;

determining a statistically significant association
between an animal's quantity of CD16 and CD2 double-
positive antigen-expressing cells and robustness; and

selecting for the animal in order to improve
robustness based on the association.

19. A method for selecting for robustness among two or
more animals, the method comprising the steps of:

providing two or more animals of the same species;

determining in each animal the quantity of CD8
antigen-expressing cells;

determining a statistically significant association
between an animal's quantity of CD8 antigen-expressing
cells and robustness; and

selecting for the animal in order to improve
robustness based on the association.

20. A method for selecting for robustness among two or more animals, the method comprising the steps of:
 providing two or more animals of the same species;
 determining in each animal the quantity of MHC-DQ
5 antigen-expressing cells;
 determining a statistically significant association between an animal's quantity of MHC-DQ antigen-expressing cells and robustness; and
 selecting for the animal in order to improve
10 robustness based on the association.

21. A method for selecting for robustness among two or more animals, the method comprising the steps of:
 providing two or more animals of the same species;
15 determining in each animal the quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQB;
 determining a statistically significant association between an animal's quantity of cells expressing an
20 antigen that is targeted by MHC-DQ antibodies as MHC-DQB and robustness; and
 selecting for the animal in order to improve robustness based on the association.

22. A method for selecting for robustness among two or more animals, the method comprising the steps of:
 providing two or more animals of the same species;
 determining in each animal the quantity of cells
25 expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD;
30 determining a statistically significant association between an animal's quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD; and
35 selecting for the animal in order to improve robustness based on the association.

23. A method for selecting for robustness among two or more animals, the method comprising the steps of:
providing two or more animals of the same species;
determining in each animal the proliferation
5 frequency of CD4 antigen-expressing cells;
determining a statistically significant association
between an animal's proliferation frequency of CD4
antigen-expressing cells and robustness; and
selecting for the animal in order to improve
10 robustness based on the association.

24. The method of claim 17 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
15 *Branta canadensis*.

25. The method of claim 18 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
20 *Branta canadensis*.

26. The method of claim 19 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
25 *Branta Canadensis*.

27. The method of claim 20 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and
30 *Branta Canadensis*.

28. The method of claim 21 wherein the species is selected from the group consisting of *Bos taurus*, *Sus*
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scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and Branta Canadensis.

5 29. The method of claim 22 wherein the species is selected from the group consisting of *Bos taurus, Sus scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and Branta Canadensis.*

10 30. The method of claim 23 wherein the species is selected from the group consisting of *Bos taurus, Sus scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and*
15 *Branta Canadensis.*

 31. A method for selecting for robustness among two or more animals, the method comprising the steps of:
 providing two or more animals of the same species;
20 obtaining a biological sample from the animals, wherein the sample comprises whole blood;
 determining in each animal the quantity of CD16 antigen-expressing cells; and
 selecting the animal with the lowest quantity of
25 CD16 antigen-expressing cells,
 thereby selecting for robustness among two or more animals.

 32. A method for selecting for robustness among two or more animals, the method comprising the steps of:
30 providing two or more animals of the same species;
 obtaining a biological sample from the animals, wherein the sample comprises whole blood;
 determining in each animal the quantity of CD16 and
35 CD2 double-positive antigen-expressing cells; and
 selecting the animal with the lowest quantity of CD16 and CD2 double-positive antigen-expressing cells,

thereby selecting for robustness among two or more animals.)

33. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of CD8
antigen-expressing cells; and

selecting the animal with the lowest quantity of
CD8 antigen-expressing cells,
thereby selecting for robustness among two or more animals.

34. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of MHC-DQ
antigen-expressing cells; and

selecting the animal with the highest quantity of
MHC-DQ antigen-expressing cells,

thereby selecting for robustness among two or more animals.

35. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of cells
expressing an antigen that is targeted by MHC-DQ
antibodies as MHC-DQB; and

selecting the animal with the highest quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQB,

thereby selecting for robustness among two or more animals.

36. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

obtaining a biological sample from the animals, wherein the sample comprises whole blood;

determining in each animal the quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD; and

selecting the animal with the highest quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD,

thereby selecting for robustness among two or more animals.

37. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

obtaining a biological sample from the animals,

wherein the sample comprises whole blood;

determining in each animal the proliferation frequency of CD4 antigen-expressing cells; and

selecting the animal with the lowest proliferation frequency of CD4 antigen-expressing cells,

thereby selecting for robustness among two or more animals.

38. The method of claim 31 wherein the species is

selected from the group consisting of *Bos taurus*, *Sus*

scrofa, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

39. The method of claim 32 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

40. The method of claim 33 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta Canadensis*.

41. The method of claim 34 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta Canadensis*.

42. The method of claim 35 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta Canadensis*.

43. The method of claim 36 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta Canadensis*.

44. The method of claim 37 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta Canadensis*.

45. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

obtaining a biological sample from the animals,

5 wherein the sample comprises whole blood;

determining in each animal the quantity of CD16 antigen-expressing cells;

determining a statistically significant association between an animal's quantity of CD16 antigen-expressing cells and robustness; and

10 selecting for the animal in order to improve robustness based on the association.

46. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

obtaining a biological sample from the animals,

wherein the sample comprises whole blood;

determining in each animal the quantity of CD16 and CD2 double-positive antigen-expressing cells;

determining a statistically significant association between an animal's quantity of CD16 and CD2 double-positive antigen-expressing cells and robustness; and

25 selecting for the animal in order to improve robustness based on the association.

47. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

30 obtaining a biological sample from the animals,

wherein the sample comprises whole blood;

determining in each animal the quantity of CD8 antigen-expressing cells;

determining a statistically significant association between an animal's quantity of CD8 antigen-expressing cells and robustness; and

selecting for the animal in order to improve robustness based on the association.

48. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of MHC-DQ antigen-expressing cells;

determining a statistically significant association between an animal's quantity of MHC-DQ antigen-expressing cells and robustness; and

selecting for the animal in order to improve robustness based on the association.

49. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQB;

determining a statistically significant association between an animal's quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQB and robustness; and

selecting for the animal in order to improve robustness based on the association.

50. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;
obtaining a biological sample from the animals,
wherein the sample comprises whole blood;

determining in each animal the quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD;

determining a statistically significant association between an animal's quantity of cells expressing an antigen that is targeted by MHC-DQ antibodies as MHC-DQD; and

selecting for the animal in order to improve robustness based on the association.

51. A method for selecting for robustness among two or more animals, the method comprising the steps of:

providing two or more animals of the same species;

obtaining a biological sample from the animals, wherein the sample comprises whole blood;

determining in each animal the proliferation frequency of CD4 antigen-expressing cells;

determining a statistically significant association between an animal's proliferation frequency of CD4 antigen-expressing cells and robustness; and

selecting for the animal in order to improve robustness based on the association.

52. The method of claim 45 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

53. The method of claim 46 wherein the species is selected from the group consisting of *Bos taurus*, *Sus scrofa*, *Ovis aries*, *Bison bison*, *Babalus babalus*, *Gallus domesticus*, *Meleagrus gallopavo*, *Anas rubripes*, and *Branta canadensis*.

54. The method of claim 47 wherein the species is selected from the group consisting of *Bos taurus*, *Sus*

scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and Branta Canadensis.

5 55. The method of claim 48 wherein the species is selected from the group consisting of *Bos taurus, Sus scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and Branta Canadensis.*

10 56. The method of claim 49 wherein the species is selected from the group consisting of *Bos taurus, Sus scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and*
15 *Branta Canadensis.*

 57. The method of claim 50 wherein the species is selected from the group consisting of *Bos taurus, Sus scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus*
20 *domesticus, Meleagrus gallopavo, Anas rubripes, and Branta Canadensis.*

 58. The method of claim 51 wherein the species is selected from the group consisting of *Bos taurus, Sus*
25 *scrofa, Ovis aries, Bison bison, Babalus babalus, Gallus domesticus, Meleagrus gallopavo, Anas rubripes, and Branta canadensis.*